

REMARKS

Claims 21-31 are pending in this application, of which claims 22, 25, 30 and 31 have been amended. No new claims have been added.

The amendment of claims 22, 25, 30 and 31 has changed the direct dependency on claim 21 into indirect dependency on claim 21 through claim 23. The amendment does not necessitate any new search, so the amendment should be entered.

(1) Claims 21, 22, 25-27 and 29-31 were rejected under 35USC§ 103(a) as being unpatentable over Otsuki ('875) in view of Miyazaki ('617).

(i) The Examiner states as follows:

Otsuki ('875) does not disclose the method of forming the layers by screen printing each of the conducting and insulating regions.
(Page 2 of the outstanding Office Action.)

Applicant argues that Miyazaki does not disclose forming successive layer on top of each other, but instead teach forming individual green sheets, which are then laminated together to form the final product. While this is true, Otsuki does disclose depositing successive layers on top of each other by discharging drops of a solvent containing a fine material to cover that area, where layers are built directly on top of each other. As discussed above, in the rejection on claim 21, it would have been obvious to one skill in the art to modify Otsuki by using the screen printing method taught by Miyazaki since both result in

finely controlled regions of a selected material, and individual layers being made up of multiple materials.

(Page 7 of the outstanding Office Action.)

As admitted by the Examiner, Otsuki does not disclose the method of forming the layers by screen printing. Also as admitted by the Examiner, Miyazaki's disclosure is forming individual green sheets, which are then laminated together to form the final product. Thus, even a combination of the references does not make the invention of claim 21.

(ii) Second, the Examiner tries to modify the Miyazaki's screen print process by Otsuki's "directly building process" ignoring the rest of the Otsuki's teachings. However, Otsuki's process is an ink-jet method or bubble jet method. See below.

[0242] As shown in FIGS. 2A and 2B, the first conductive layer (interconnect pattern including a plurality of lines, for example) 20 is formed. The first conductive layer 20 is formed on the substrate 10. The first conductive layer 20 may be formed to pass through the depression section 14. The first conductive layer 20 is formed by discharging drops of a solvent containing fine particles of a conductive material (metal such as gold, silver, or copper, for example). An ink-jet method or a Bubble Jet (registered trademark) method may be used. As a solvent containing fine particles of gold, "Perfect Gold" (manufactured by Vacuum Metallurgical Co., Ltd.) may be used. As a solvent containing fine particles of silver, "Perfect Silver" (manufactured by Vacuum Metallurgical Co., Ltd.) may be used. There are no specific limitations to the size of the fine particles. The fine particles used herein refer to particles which can be discharged together with a solvent. The first conductive layer 20 may be formed by sintering the discharged

**solvent containing fine particles of a conductive material at
about 200 to 600.degree. C. for about 1 to 5 hours.
(Paragraph [0242] of Otsuki. Emphasis added.)**

As argued by the Applicants in the previous Response, Miyazaki uses ceramic green sheets [0060], and the ceramic green sheets are laminated to form a green laminates ([0032]) as shown in Fig. 5. Miyazaki does not disclose that both of a first basic layer, comprising a first layer and a second layer, and a second basic layer are formed by screen-printing. The second basic layer of Miyazaki, formed by screen-printing, is not directly formed on the screen-printed first basic layer. The teaching of Miyazaki is to laminate a screen printed green sheet ([0032]).

Even if the Miyazaki's green sheet by screen printing to laminate is modified by the Otsuki's ink-jet method or bubble jet method, the modified green sheet still needs to be laminated, which should be distinguished from the claimed method. Neither Miyazaki nor Otsuki teaches the screen-printed second basic layer directly formed on the screen-printed first basic layer.

(iii) Moreover, because the screen printing taught by Miyazaki is completely different from the Otsuki's ink-jet method or bubble jet method. One skilled in the art is not motivated to modify Miyazaki's teaching in view of Otsuki. Thus, claim 21 is not obvious over the cited references. Reconsideration of the rejection is respectfully requested.

(2) Claims 23 and 24 were rejected under 35USC§ 103(a) as being unpatentable over Otsuki ('875) and Miyazaki ('617) in view of Ushikoshi ('606).

The same arguments above are applied to claim 23. In addition, the applicant submits that claim 23 is allowable standing alone.

Claim 23 recites a step of screen-printing a fifth dielectric material in a fifth region of the base at a periphery of the first region, to form a stress mitigating layer. The claimed stress mitigating layer mitigates the stress between the dielectric layers having different dielectric constants from each other.

As admitted by the Examiner, neither Otsuki (R75) nor Miyazaki ('517) discloses the features of claim 23. However, the Examiner relies on Ushikoshi ('606). However, Ushikoshi is irrelevant to the present invention.

(i) First, Ushikoshi ('606) discloses a ceramic heater. See the title of Ushikoshi. The teaching of Ushikoshi does not relate to the teachings by Miyazaki and Otsuki. One skilled in the art in the field of Miyazaki or Otsuki does not refer to the teaching of Ushikoshi because it is irrelevant to the present invention.

(ii) Second, even if Ushikoshi discloses a stress-mitigating layer as stated by the Examiner, Ushikoshi's stress mitigating layer does not correspond to the claimed stress mitigation layer.

Ushikoshi discloses that a resistive heating element 22 is composed of a spirally coiled body and made of a metal having a high melting point, which is embedded in a substrate 70 made of aluminum nitride (Fig. 2). Ushikoshi teaches that when the resistive heating element 42 (22) has a laminated structure composed of a heat generator body 43 made of molybdenum, a molybdenum carbide layer 44 and a molybdenum oxide layer 45, durability of the ceramic heater against heat cycles is conspicuously improved (Fig. 4, col. 8, lines 28-35). The molybdenum oxide layer 45 functions as a protective layer or a stress-mitigating layer (col. 9, line 1-5). The Examiner might have considered that the molybdenum carbide layer 44 or the molybdenum oxide layer 45 corresponds to the claimed "stress mitigating layer."

However, Ushikoshi's stress mitigating layer mitigates the stress between a conductive or metal body (resistive heating element made of molybdenum or others) and a ceramics body (substrate made of aluminum nitride). On the other hand, the claimed stress mitigating layer mitigates the stress between the first dielectric layer and the second dielectric layer. In other words, the claimed stress mitigating layer mitigates the stress between the dielectric layers having different dielectric constants, which are formed in the same layer within the laminated

multi-layer structure formed by screen printing. More specifically, the stress due to the shrinkage rate difference between the different dielectric materials is mitigated in the present invention. The stress mitigating layer of the present invention is completely different from that disclosed by Ushikoshi ('606) at least because the claimed mitigating layer mitigates the stress between the same kind of materials, i.e., the dielectric layers, whereas the teaching in Ushikoshi mitigates the stress between different kinds of materials, i.e., a metal body and a ceramic body. Thus, the stress mitigated in the present invention is different from that taught by Ushikoshi. Therefore, Ushikoshi's stress mitigating layer does not correspond to the claimed stress mitigation layer.

(iii) In addition, the present invention is completely different from Ushikoshi in view of the structure in which the stress is generated. In the present invention, the stress is generated between the first dielectric layer and the second dielectric layer, both of which are formed in the same first layer within the laminated layers. As clearly shown in Fig. 1, the stress mitigating layers 22a, 22b are formed between the high dielectric layer 20a and the base dielectric layer 24a in the first layer 10, between the high dielectric layer 20b and the base dielectric layer 24b in the second layer 12,..., respectively. In the present invention, screen printing is utilized to form the stress mitigating layer, and the stress mitigating layer can be precisely formed without positional deterioration.

On the other hand, in Ushikoshi, the stress mitigated by the molybdenum carbide layer 44 or the molybdenum oxide layer 45 is generated between the substrate 70 of aluminum nitride and the resistive heating element 70 (heat generator body 43) fully embedded in the substrate 70. The stress in such an embedding structure is generated in a manner different from the stress generated between the distinct dielectric layers formed in the same layer within the laminated multi-layers. Accordingly, Ushikoshi's stress mitigating layer is different from the present invention.

(iv) Also, even if Ushikoshi's stress mitigating layer corresponds to the claimed stress mitigation layer, Ushikoshi does not disclose any screen-printing to form a stress mitigating layer as recited in claim 23,

(v) Thus, claim 23 is not obvious over the cited references. Reconsideration of the rejection is respectfully requested.

(3) Claim 28 was rejected under 35USC§ 103(a) as being unpatentable over Otsuki ('875) in view of Miyazaki ('617) and Yamana ('374).

The same arguments for the rejection on claims 21 and 23 are applied to this rejection. Also, claim 28 depends on claims 21 and 23. Thus, claim 28 is not obvious over the cited references.

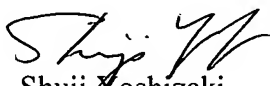
Amendment after Final
Application No. 10/724,615
Attorney Docket No. 032152

(4) In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned representative at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,
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